

FIG. 1

2/11

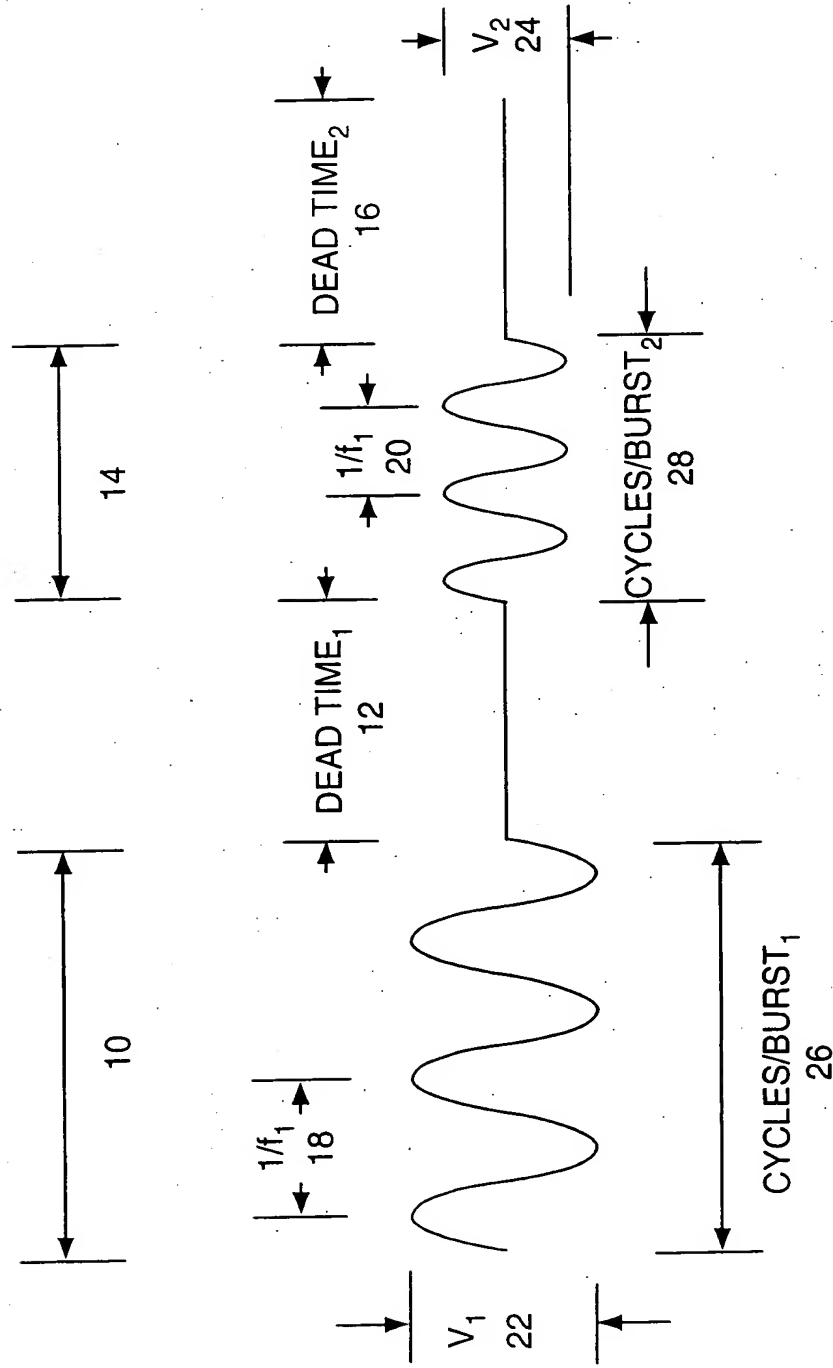


FIG. 2

3/11

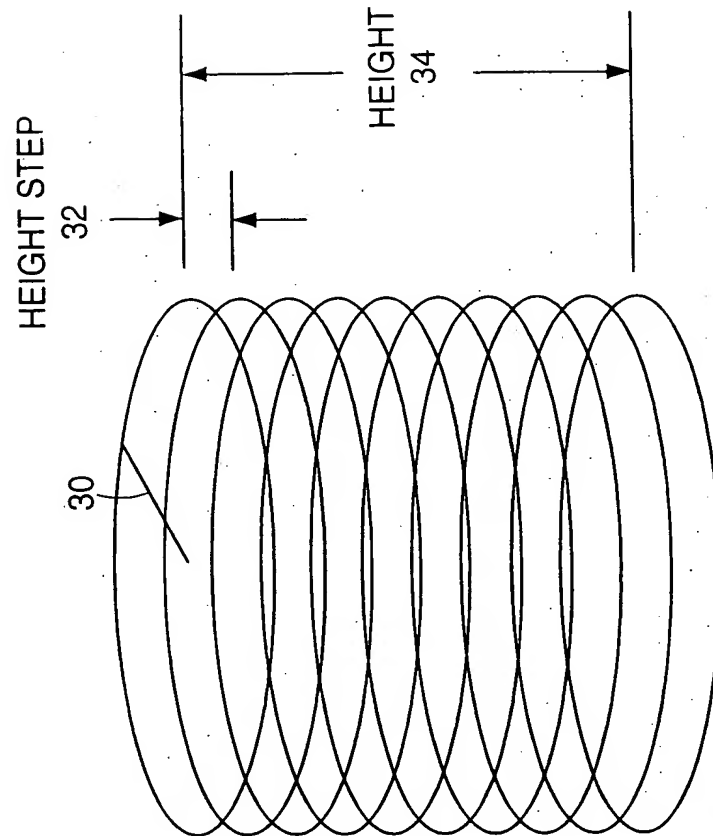
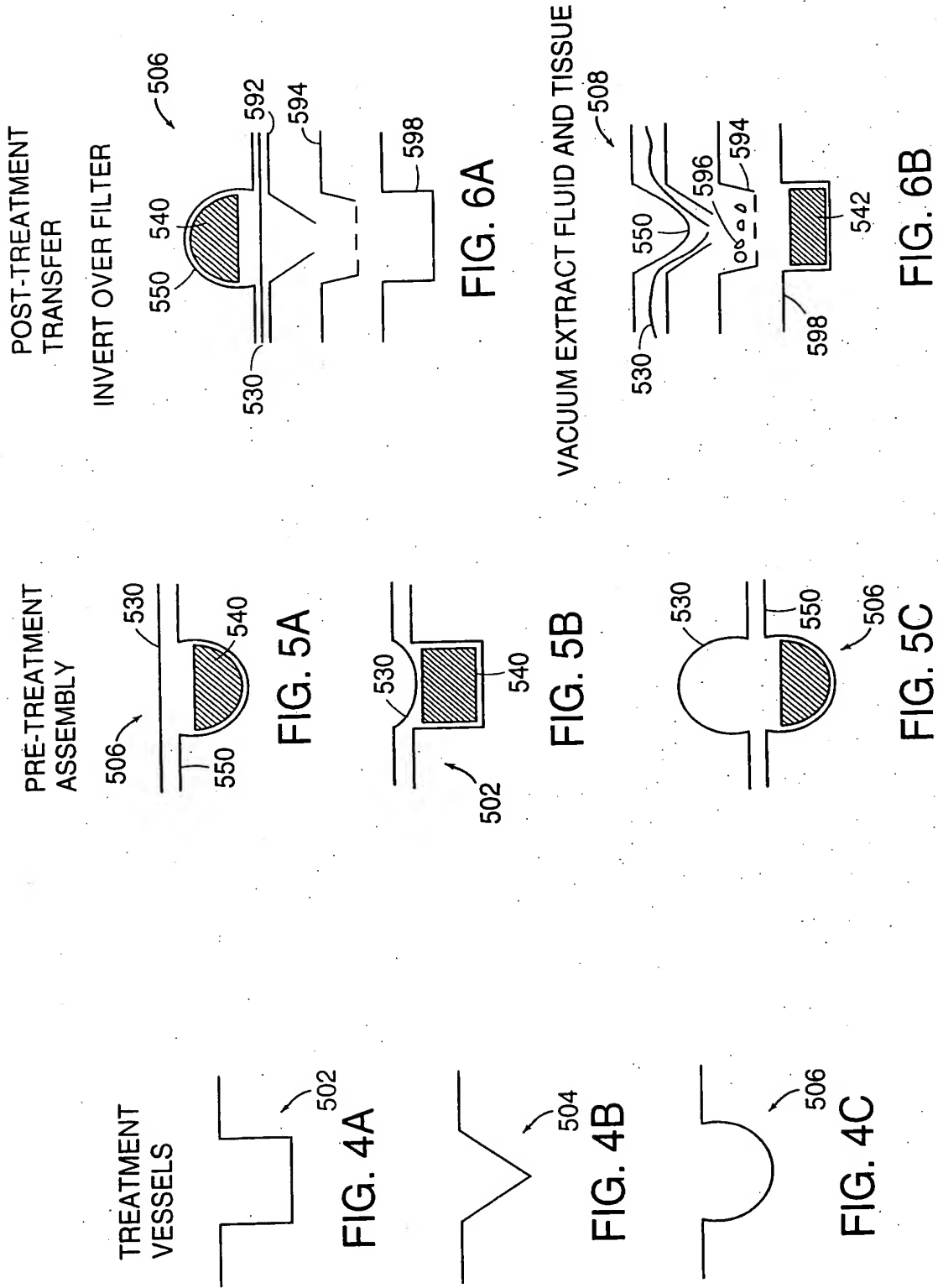


FIG. 3

4/11



5/11

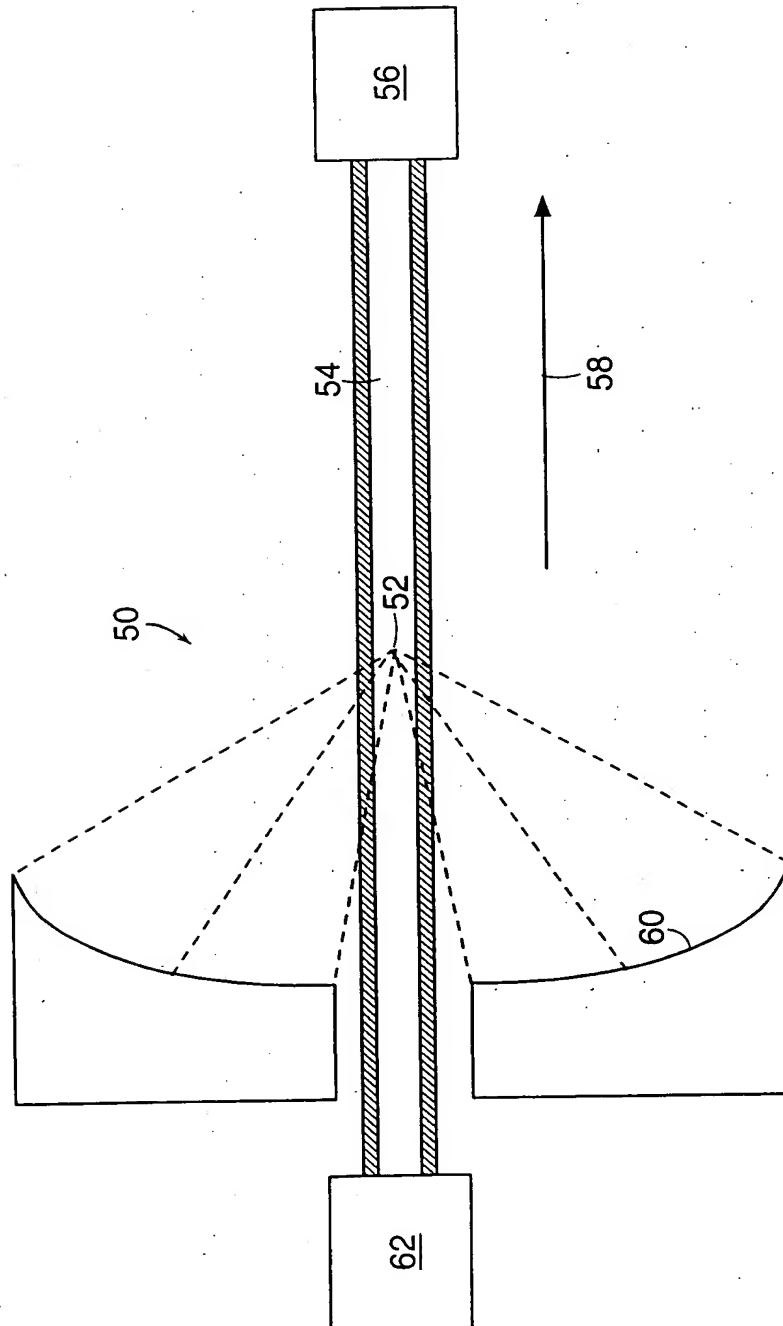


FIG. 7

6/11

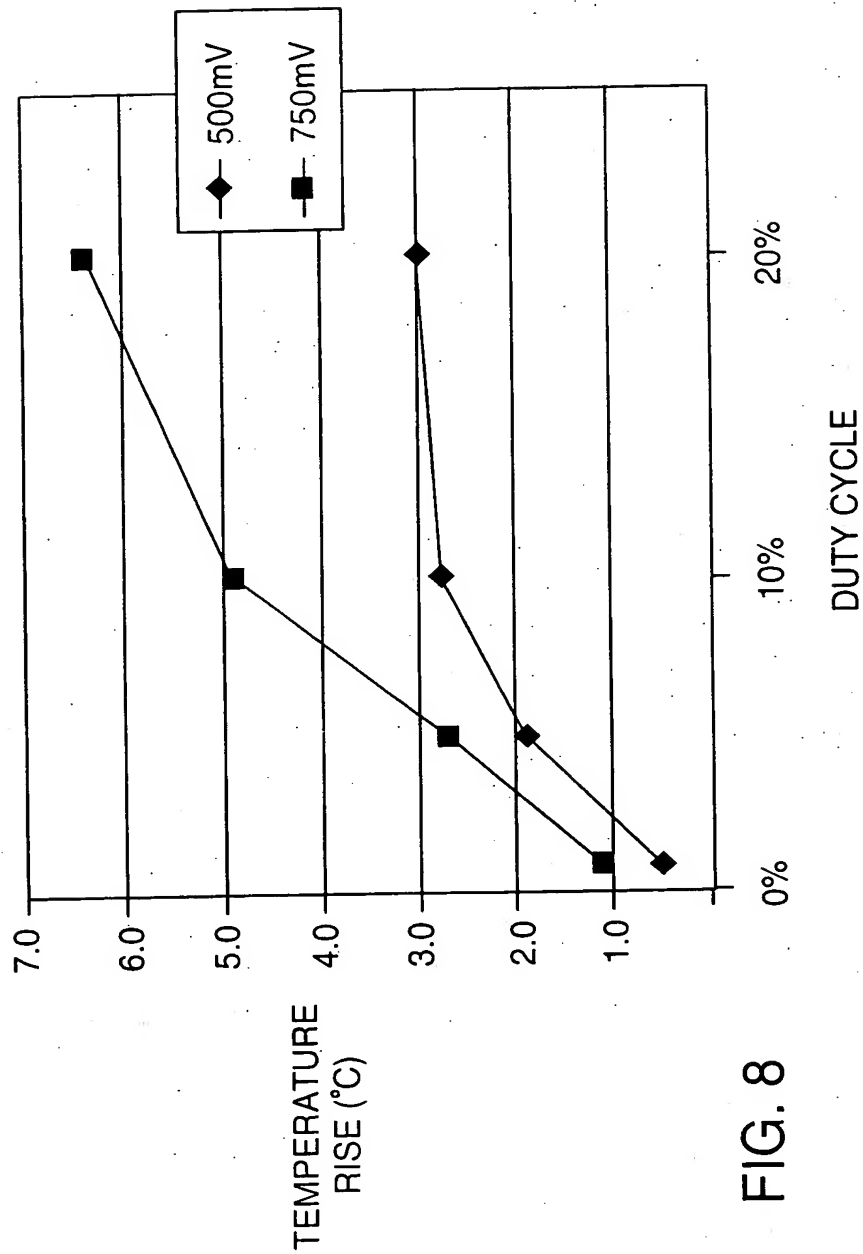


FIG. 8

7/11

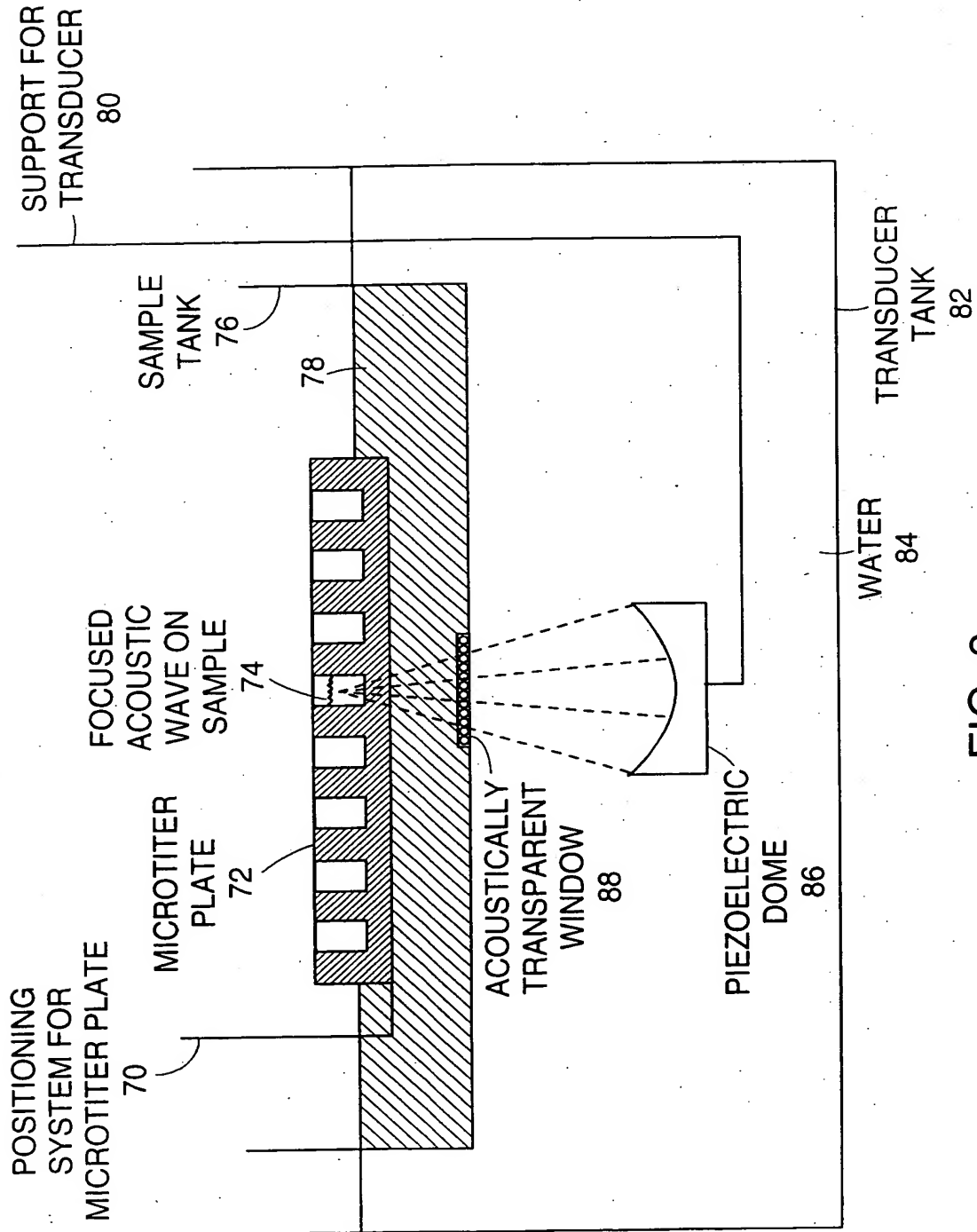


FIG. 9

SYSTEM SPECIFICATIONS	EXTRACTION	TRANSFORMATION	RESEARCH
PERFORMANCE: FORMAT TREATMENT TIME TEMPERATURE ACOUSTIC PARAMETERS BATH TEMP CONTROL SAMPLE TEMP RISE FREQUENCY TREATMENT PROFILE ACCUSTIC WAVEFORM ACCUSTIC MASK UNDER PLATE TRASVERSE TIME BETWEEN SAMPLES ATMOSPHERE CONTROL	MICROTITER 50 SEC PER WELL +4 TO +25°C <4°C 1.1 MHz SHOCK 2 SEC NONE	MICROTITER +4 TO +40°C VARIABLE 1.1 MHz SINE, SHOCK 2 SEC GAS, OVERPRESSURE	VARIABLE VARIABLE -10 TO +40°C VARIABLE 1.1, 3.3 MHz SINE, SHOCK VARIABLE GAS, OVERPRESSURE
CONSUMABLE: FORMAT VOLUME SINGLE USE? STERILE	96WELL PCR PLATE, OFF-THE-SHELF 200 µl STANDARD. OTHER OPTIONS YES OPTIONAL	24 WELL PLATE VARIABLE YES YES	VARIABLE SINGLE AND MULTI OPTIONAL
PROCEDURE:	TRANSFER TO PLATE ADD FLUID HEAT SEAL PLATE STORE AT -80°C TREAT AT +4°C PLACE ON VACUUM FIXTURE VACUUM TRANSFER TO MICROTITER OPTION: FILTER AT TRANSFER	ALLOQUOT CELL CULTURE INTO PLATE TREAT AT CONTROLLED TEMPERATURE TRANSFER TO GROWTH MEDIUM	
MECHANICAL: FORMAT WATER BATH WATER VOLUME TEMPERATURE CONTROL CIRCULATION PUMP DEGASSING SYSTEM	BENCHTOP PLUS HALF-RACK AND CHILLER 1 GAL (3.79L) DISTILLED WATER	BENCHTOP PLUS HALF RACK 1 GAL (3.79L) DISTILLED WATER	CART PLUS RACK 15 GAL (56.85L)

8/11

FIG. 10

SYSTEM SPECIFICATIONS	EXTRACTION	TRANSFORMATION	RESEARCH
INSTRUMENT CONTROL: LabVIEW X-Y-Z POSITIONING (SAMPLE) Z- AXIS (TRANSDUCER) TEMPERATURE FEEDBACK TO PROTOCOL PARTIAL TREATMENTS CAVITATION DETECTION VIDEO DETECTION AND ANALYSIS.	YES MANUAL, 25MM RANGE YES YES NO	YES MANUAL, OPTIONAL AUTO YES OPTIONAL OPTIONAL	YES MANUAL YES NO YES YES
USER INTERFACE: LabVIEW TREATMENT PROTOCOL SELECT TREATMENT POSITIONS TEMPERATURE PROFILE RECORD TIMING INFORMATION	FIXED PRE ADDRESSED OPTIONAL YES	USER ADJUSTABLE USER ADJUSTABLE YES YES	FLEXIBLE FLEXIBLE YES YES
ELECTRICAL: POWER: 110V, 20A			
EQUIPMENT: CHILLER RF AMPLIFIER ARBITRARY WAVEFORM GENERATOR OSCILLOSCOPE COMPUTER MOTION CONTROL I/O BOARDS AMPLIFIER XY STAGE IR TEMPERATURE MEASUREMENT VIDEO LASER SIGHT/CROSS-HAIRS VACUUM FIXTURE TRANSDUCER MATCHING NETWORK CABLES CIRCULATION PUMP CONVECTION COOLING FILTER CAVITATION DETECTION	YES YES YES NO YES YES YES NO YES YES YES NO YES YES	NO YES YES OPTIONAL YES YES YES OPTIONAL YES NO OPTIONAL	YES YES YES YES YES YES YES YES YES YES YES

9/11

FIG. 11

LabVIEW PROGRAMMING TASKS			TRANS- FORMATION
	EXTRACTION		
GENERAL			
DISPLAY REVISION LEVEL	X		X
SAFETY INTERLOCKS	X		X
TIME AND DATE STAMP			X
STOP FUNCTION	X		X
SAVE CONFIGURATION TO FILE	USER CAN RESET DEFAULTS		X
OPERATING PARAMETERS			X
PROTOCOL			X
SAVE DATA TO FILE			
TREATMENT POSTIONS AND			X
PROTOCOLS			
TEMPERATURE PROFILE			X
ERROR CONDITIONS			X
PASSWORD PROTECTION ON VIS	X		X
LOAD CONFIGURATION FROM FILE			X
USER SELECTS TREATMENT POSTIONS	X		X
DISPLAY			
USER SELECTABLE TREAMENT	X		X
POSITIONS -GRAPHICAL			
CURRENT STATUS			X
TREATMENT POSITION -GRAPHICAL	X		X
CURRENT PROTOCOL	BY NAME		X
-VOLTAGE			X
-DUTY CYCLE			X
-ETC			X
TIME TO FINISH CURRENT SAMPLE	X		X
SAFETY INTERLOCK STATUS	X		X
SAMPLE TEMPERATURE, GRAPH			X
AND CURRENT TEMP			X
TIME AND DATE			
ULTRASONICS			
INITIALIZE INSTRUMENT(S)	X		X
STOP FUNCTION	X		X
MIX AND TREAT	PREDETERMINED		USER PROGRAMMABLE
FREQUENCY	PREDETERMINED		X
VOLTAGE-TREAT	PREDETERMINED		X
VOLTAGE-MIX			X
PULSELENGTH-TREAT	PREDETERMINED		X
PULSELENGTH-MIX			X
DEADTIME-MIX>TREAT			X
DEADTIME-TREAT>MIX			X
TOTAL CYCLES (OR TIME)	PREDETERMINED		X
CAVITATION DETECTION			OPTIONAL
POSITIONING			
SETUP AND DIAGNOSTICS			
INITIALIZE STEPPER	X		X
CONTROL BOARD	X		X
CALIBRATE (HOME)	X		X
CHECK LIMITS (LIMIT SWITCHES)			

FIG. 12

11/11

LabView PROGRAMMING TASKS		EXTRACTION	TRANSFORMATION
POSITIONING			
SETUP AND DIAGNOSTICS PROGRAM SAMPLE POSITIONS PROGRAM DITHERING		PREDETERMINED PREDETERMINED	PREDETERMINED X
OPERATION SELECT SAMPLE FORMAT SELECT TREATMENT POSITIONS SELECT TREATMENT FOR EACH POSITION SELECT DITHERING PROFILE STOP AT LIMITS		PREDETERMINED PREDETERMINED X ON/OFF ONLY X	X X X X X
TEMPERATURE			
MEASURE TEMPERATURE			X
DISPLAY TEMPERATURE MOMENTARY GRAPH			X X
RECORD TEMPERATURE CURRENT TEMPERATURE RECORD MIN/MAX SAVE TO FILE			X X OPTIONAL OPTIONAL
MANAGE PROCESS BASED ON TEMPERATURE PAUSE PROCESS TO COOL MODIFY PROCESS GO TO NEXT WELL AT SET TEMPERATURE RISE			

FIG. 13